to the westward, where it showed some intensity until the 8th, then weakening until the 11th, when it became negligible. On the 14th the Gulf of Alaska was again the center of an area of low pressure which fluctuated in movement and intensity until the 21st, when it spread to the southward with greatly increased energy. On the 22d to 24th its influence was such that it dominated most of the eastern half of the region previously occupied by the anticyclone, causing strong westerly and northwesterly gales. Several trans-Pacific steamships crossed this storm area. Among them the British S. S. *Empress of Asia* reported the lowest observed corrected pressure reading, 28.90 inches, at 7 p. m. of the 23d, in 50° 05′ N., 140° 29′ W. On the 26th the storm weakened and began moving inland.

About this time the Aleutian LOW proper redeveloped west of Alaska, apparently consequent upon the entrance into Bering Sea of the typhoon of the 13th to 25th, previously mentioned, and thence to the end of the month it fluctuated across the whole Alaskan region.

On the 30th west-southwesterly gales were observed near 45° 25′ N., 164° E. It was the reported beginning of a storm which, early in October, produced violent if not hurricane winds to the eastward.

Considering the eastern portion of the ocean, as represented by the island stations of Dutch Harbor, Midway Island, and Honolulu, pressure during September was above the normal. The excess at the first-named station, based on p. m. observations, was 0.21 inch. The highest pressure was 30.46 inches, recorded on the 17th, the lowest, 29.04 inches, on the 7th. At Midway Island the plus departure was 0.03 inch. The highest pressure here, 30.16 inches, occurred on the 18th, the lowest, 29.82, on the 29th. At Honolulu the plus departure was approximately 0.02 inch. The highest pressure, 30.10, occurred on the 26th, the lowest, 29.89, on the 12th.

Fog was observed by a large percentage of the vessels traversing the northern sailing routes. It was well distributed throughout the month in both eastern and western waters, and some observers reported it for several consecutive days covering many degrees of longitude.

FOUR SEVERE TYPHOONS IN THE FAR EAST DURING SEPTEMBER, 1922.

By Rev. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

There were four severe typhoons in the Far East during this month. All formed in the Pacific. Two went to China after striking Meiacosima and Formosa, respectively; another traversed the Babuyanes Islands and northern Luzon in the Philippines; and the last remained in the Pacific, recurving northeastward to the southwest and west of the Bonins.

The Meiacosima and China typhoon.—This typhoon was shown in our weather maps of September 7 to 9 over the Pacific between the Ladrone Islands and the Philippines, about 500 or 600 miles to the east of northern Luzon. At 6 a. m. of the 10th, it could be easily situated northeast of Luzon, between 127° and 128° longitude E., 20° and 21° latitude N., moving northwest. The center passed over the Meiacosima group of islands during the night of September 10 to 11, the barometer of Ishigakihima station having fallen to 740.4 mm. (29.15 inches), at 1 a. m. of the 11th, and the wind from WSW., having reached its maximum velocity of 30 meters per second (67 miles per hour), at 10 p. m. of the 10th. The typhoon inclined to WNW. after traversing Meiacosima and entered China during the night of the 11th–12th, passing over Wenchow where it caused great destruction and terrible losses, especially in the river. The typhoon, once in China, recurved northeastward to the west of Shanghai during the night of the 12th and early morning of the 13th. It reached the Shantung Promontory on the morning of the 14th, and northern Korea at about noon of the same day; but it seems that on that day, at least in the afterooon, it was only a depression of no great importance.

The Babuyanes and Ilocos typhoon.—We do not hesitate to call this one of the most remarkable typhoons observed in the Philippines in many years, particularly as to its abnormal track. It formed over the Pacific, on the 11th to 12th, to the west of the Ladrone Islands, between 15° and 16° latitude N. and near 139° longitude E. It moved first W. by N., then NW. by W., until 6 a. m. of the 16th, when near the Balintang Channel it recurved to WSW., to SW., and even to SSW., following the last-named direction very near the western coast of Luzon from Laoag to Bolinao. At about the latitude of Bolinao the typhoon moved for a few hours to SW. until in about 16° latitude, between 118° and 119° longitude it recurved back to NW., thus tracing a track very similar to a typhoon barographic record. A good number of steamers experienced the violence of the storm in the China Sea, among them the *Loong Sang*, the *Susana II*, and the *Tango Maru*, all the captains having been much surprised at its remarkably abnormal track.

Following are some of the barometric minima observed in Luzon during the typhoon:

	Longitude.	Latitude.	Barometer.
	° ′	° ′	*Mm.*
Aparri	121 38	18 22	734.55 (28.92) at midnight, 16th.
Cape Bojeador	120 36	18 31	728.40 (28.68) at 6:40 a. m., 17th.
Laoag	120 35	18 12	732.40 (28.84) at 7 a. m., 17th.
Vigan	120 23	17 34	737 (29.02) at 2 p. m., 17th.
San Fernando Union	120 19	16 37	739.73 (29.12) at 6:15 a. m., 18th.
Bolinao	119 53	16 24	735.41 (28.95) at 6 a. m., 18th.
Iba	119 58	15 20	745.18 (29.34) at 4 a. m., 18th.

The barometric minima of the *Loong Sang*, *Susana II*, and *Tango Maru* were:

	Longitude.	Latitude.	Barometer.
	° ′	° ′	*Mm.*
Loong Sang	118 32	16 46	735.06 (28.94) at 1 a. m., 19th.
Susana II	117 30	18 33	738.64 (29.08) at 4 p. m., 19th.
Tango Maru	116 11	20 39	747.76 (29.44) at 4 a. m., 20th.

It has been reported that in Fuga Island (Babuyanes Islands) the barometric minimum was as low as 695 or 696 mm. (27.36 or 27.40), that there was one hour of vortical calm observed, and that only one house was left standing after the typhoon.

Following is the position of the typhoon for 6 a. m. and 2 p. m. of the 16th to 20th:

	Latitude.	Longitude.
	° ′	° ′
16th—6 a. m.	19 35	124 15
2 p. m.	19 25	123
17th—6 a. m.	18 35	120 45
2 p. m.	17 45	120
18th—6 a. m.	16 35	119 25
2 p. m.	16	118 45
19th—6 a. m.	17 15	117 15
2 p. m.	18	116 40
20th—6 a. m.	18 45	115 10
2 p. m.	19 05	114 05

After 2 p. m. of the 19th the typhoon moved WNW., or W. by N., and it is very probable that it filled up on the 21st near the northern part of Hainan or the southern China coast north of Hainan.

The typhoon of the Ladrones and the Bonins.—This typhoon seems to have formed on the 13th to 14th over the Ladrone Islands, about 250 miles north of Guam, where a gale from the southwest quadrant was observed for a good number of hours on the 15th and 16th. The typhoon moved slowly NW. on the 14th to 17th and recurved gradually to NE. on the 18th and 19th southwest and west of the Bonins. A gale from the S. was reported on the 20th by the station of Chichijima. The typhoon was situated at noon of the 21st in about 144° longitude E. and near 35° latitude N., moving northeastward.

The typhoon of Formosa and China.—The last typhoon of the month appeared on the 25th over the Pacific about 300 miles to the east of San Bernardino Strait. The first part of the track before the 25th is not certain, but probably it formed north of Yap and west of Guam on the 24th near 139° longitude E. and 13° latitude N., and moved westward until the 25th or 26th, when it inclined northwestward. The typhoon was situated at 6 a. m. of the 27th near 125° longitude E. and 16° latitude N., moving NW. by N. At 6 a. m. of the 28th, the center was near or over the Batanes Islands, and in the afternoon of the same day it traversed Formosa, moving still NW. by N. On the 29th, in the early morning, the typhoon entered China not far from 119° longitude E. and 26° latitude N.

Besides the typhoon just mentioned, a low-pressure area traversed Luzon, to the south of Manila, moving westward on the 23d. Once in the China Sea it developed into a depression or typhoon which moved probably WNW, and finally filled up in about 111° longitude E. and 16° latitude N.

Before finishing this article we may add that the last typhoon of August, after passing to the west of Shanghai, recurved NE. toward Korea and the Sea of Japan. It was felt severely in Korea during the night of September 3 to 4.

NOTES ON WEATHER IN OTHER PARTS OF THE WORLD.

British Isles.—During the month roughly half the area of the British Isles received a rainfall below the average. * * * The deficiencies were nowhere very large, amounting to more than 40 per cent only in the Western Highlands. * * * The rainfall over the British Isles was rather more uniform than is usual at the season.

The general rainfall expressed as a percentage of the overage was: England and Wales, 123; Scotland, 87; Ireland, 117; British Isles, 110.

In London, Camden Square, the mean temperature for September was 55.5° F., or 2.2° F. below the average.[1]

Switzerland.—ROME, September 14.—Reports from the Alps say that snow is falling heavily. At some places it has reached a foot in depth, especially around Mont Blanc, Simplon, and St. Gothard. In the Tyrol the temperature has fallen to winter levels in contrast to the excessive heat of a few weeks ago.—*New York Herald, September 15, 1922.*

China.—A typhoon broke over Chefoo (Shantung) on the 2d and lasted for 36 hours, but the damage done was not very extensive.[1]

Philippine Islands.—MANILA, September 19.—Serious damage is believed to have resulted from a typhoon which has swept over the Philippines for the last 36 hours.—*New York Herald, September 19, 1922.*

Australia.—Excellent rains were recorded throughout South Australia during the month and there was every prospect of a really good harvest. The other States also had good harvests.[1]

Brazil.— * * * The distribution of rain in the north and central regions was very irregular, some parts having a fall exceeding the normal and others a deficit. In the southern area the rainfall averages 39 mm. below normal. Small high-pressure areas with very active wind circualtions prevailed throughout the month and temperatures were generally high. The state of the crops was satisfactory on the whole.[1]

[1] *Meteorological Magazine*, October, 1922.

DETAILS OF THE WEATHER IN THE UNITED STATES.

GENERAL CONDITIONS.

A warm, dry month in practically all parts of the country. Drought was most severe south of the 40th parallel; in Kansas, North Dakota, and parts of the upper Lake region, the upper Ohio Valley, and in the District of Columbia, however, rainfall was above normal. (*See* inset on Chart IV.)

The dry weather was rather definitely related to the pressure distribution and the latter naturally was conditioned by the movement in latitude of cyclones and anticyclones, particularly the slow southeastward drift of the latter across the Lake region, New England, and the Middle Atlantic States, as shown by Charts I and II.

CYCLONES AND ANTICYCLONES.

By W. P. DAY.

No really important storms were charted within the area of the United States proper; however, there were three storms of tropical or near tropical origin in the western Atlantic Ocean adjacent to our coast. The two storms, marked "III" and "V" on the chart were the small typical vortices of young tropical cyclones or hurricanes. The third (No. VI), larger and more far-reaching in its effects, developed on the south side of a strong anticyclone, the consequent constriction of the isobars between the two centers of action causing winds